

SAFETY ALERT



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Sprag Brake Clutch Failure Leads to Near Miss



Figure 1: The replacement winch. This winch is similar to the one that was involved in the incident.

On 13 October 2018, while lifting a construction lay down box (2500 lbs) from a motor vessel with the platform crane auxiliary line, the crane operator proceeded to raise the load. When the load was approximately 6 feet off of the deck, the winch failed resulting in the load free falling back to the deck of the boat. The winch continued to unspool after the load hit the deck causing the rigging to also fall to the deck. A deckhand on the motor vessel was able to avoid the falling load. There were no injuries to personnel or harm to the environment as a result of the incident.

The winch was removed from service by the crane mechanic and sent to a 3rd party facility to be pull tested, brake tested and disassembled. During testing, it was found that it would randomly fail to hold the load when the load was released and then pulled again. A full quarterly inspection of the crane had been completed with no problems the week before the incident.



Figure 2: The disassembled sprag brake clutch

When disassembled, it was found that the sprag brake clutch was not as tight and rigid as normal and would randomly slip in certain positions. After disassembly, the sprag clutch was found to have abnormal marks on the outer and inner surface of the sprag components potentially caused by shock loading and/or faulty components.

A representative of the crane manufacturer stated that identical or similar components are widely used on cranes in the Gulf of Mexico.

Additional analysis of the failed components is being conducted by the crane manufacturer – depending on the results, testing and inspection procedures may be revised.

Therefore, BSEE recommends that operators consider the following:

- Look for warning signs of a sprag brake clutch malfunction (e.g. slipping after the winch stops). Crane operators should report any abnormal behavior to mechanics and facility management.
- Verify control mechanisms including brakes and clutches for proper operation in compliance with API RP 2D C.4.1 (6th edition) and manufacturers recommendations during pre-use, monthly, quarterly, and annual inspections.
- Winches should be periodically disassembled and all wear items should be inspected for damage. Typical inspection intervals are one to five years, and may vary depending on frequency of use. Refer to the manufacturer's recommendations and applicable industry codes such as API RP 2D (Section C.4.1). Consider ASME Spec B30.5-2004 (chapter 5-2) for guidance.
- If you do not have records of the last winch disassembly and the winch is over five years old, limit use of the winch and schedule a disassembly and inspection soon.
- Conduct periodic oil sampling and analysis.
 - Record and trend results over time – high levels or sudden increases in iron contaminants may indicate serious mechanical problems. Disassembly of the winch may be required to determine the cause.
 - Oil should be changed regularly, typically annually. Use only the oil type specified by the manufacturer. Improper oil may lead to brake clutch slippage.
- Conduct a winch warm-up procedure at crane start-up to help prevent brake slippage. This is especially important during cold weather.
- Avoid shock loading the crane. If you suspect that a crane has been shock loaded, safely lower the load, remove the crane from service and follow the manufacturer recommended inspection procedures to verify that the crane has not been damaged.
- Review all communications and safety bulletins from crane manufacturers and share them with your crane operators, mechanics and riggers.

-- BSEE --

A Safety Alert is a tool used by BSEE to inform the offshore oil and gas industry of the circumstances surrounding an accident or near miss. It also contains recommendations that should help prevent the recurrence of such an incident on the Outer Continental Shelf.